

HAYSPUR FISH HATCHERY

ANNUAL REPORT

January 1, 1991 - December 31, 1991

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INTRODUCTION

Hayspur Fish Hatchery is a license-funded broodstock and production facility. The hatchery maintains two broodstocks: rainbow trout Oncorhynchus mykiss called the Hayspur strain and a Kamloop strain rainbow trout O. mykiss derived from Skanes and Gloyd Springs stock. Eyed egg production for six resident hatcheries has been a priority since renovation in 1989. Catchables and fingerling are reared for stocking in the Big Wood and Salmon river drainages.

The facility (elevation 4,880 ft) is located in Blaine County on Loving Creek, approximately 18 miles southeast of Hailey, Idaho. Culture apparatus consists of a new incubation building, a hatchery building, eight covered circular ponds, six small fingerling raceways, six large production raceways, and an earthen brood pond.

Water sources include: the Hayspur spring 3 to 5 cfs at 53°F (11.6°C); artesian wells 2.5 cfs at similar temperatures; and water diverted from Loving Creek 8 to 22 cfs at 33°F to 73°F (5.5°C to 22.7°C).

Personnel include: three permanent employees; Fish Hatchery Superintendent II, Fish Hatchery Superintendent I, Fish Culturist, and 10.6 months of temporary time; Bio-Aide.

FISH PRODUCTION

Low flows, fluctuating dissolved oxygen levels, temperatures in the 70s, and construction activities resulted in reductions in fish production. Whenever possible, fish were stocked early to reduce biomass at the hatchery. Also, the fingerling request was reduced by 50,000.

A total of 496,899 rainbow trout were produced. Fall fingerling production goal of 250,000 for Magic Reservoir was met through an exchange. The Hagerman Hatchery stocked 15,000 fingerling into Magic Reservoir after an aborted trip to Little Wood Reservoir. Hayspur stocked 235,060 fingerling into Magic reservoir and 15,000 into Little Wood reservoir. Fifty thousand (50,000) **fingerling** stocked into Magic Reservoir were adipose clipped. Due to drought effects and biomass at maximum levels, a total of 50,000 fingerling were stocked prior to the last "stock run." A stock run is performed to fill stock tanks in the area south of Magic Reservoir via the Richfield Canal, whereby Magic Reservoir will drop eight vertical feet. It should be noted that plants made before and after these stock runs contained the same proportion of adipose clipped fingerling (20%).

Catchable production totaled 246,839 fish weighing 83,328 pounds (see Table 1). These fish were stocked into the Big Wood, Little Wood, and upper Salmon river drainages. A total of 32,704 catchables were transported to the Mullan Hatchery for redistribution in Region 1 waters. Sawtooth Fish Hatchery was shipped 57,229 catchables for redistribution into the Salmon River upstream of the Pahsimeroi River and Stanley Basin lakes. A request, by new commissioner Wes

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Rose, was accommodated involving 15,477 catchables. Magic Valley Flyfishermen adipose clipped 13,000 fish and floy tagged 2,000 fish in early February. These fish were stocked into the Bell Rapids area of the Snake River.

Drought conditions lead to the cancellation of the request for Fish Creek Reservoir and reduced the request for Thorn Creek Reservoir. Catchables available due to the above reductions were used to make fishing better in creative areas as: Bellevue Canal, Little Wood River above the reservoir (High Five Campground), Little Wood River below the reservoir, Little Wood River - Richfield area, and Little Wood River - Shoshone area.

HATCHERY IMPROVEMENTS

Improvements to the hatchery were as follows:

1. Construction of incubation/spawning building.
2. Excavation, pipe, pump, fittings, manholes, and packed column for the addition and treatment of water from well no. 3 to the headbox.
3. Fabrication of an egg picking table, egg enumeration/egg shipping area, and a lighted egg picking trough.
4. Feed machine was completely stripped and repainted. Thanks to Jim Nixon of Sawtooth Fish Hatchery.
5. A new transport tank for the 1-ton truck was purchased and fitted with safety walkways.
6. Heath incubators from Ashton, American Falls, and Mackay were disinfected and installed in the new incubation building.
7. A 1/2-ton pick-up truck was purchased to replace a 1976 Dodge.

Needs of the hatchery listed in order of priority are as follows:

1. Replace domestic water line and domestic pump.
2. Brood pond needs to have sediment removed. Suction dredge method looks good if neighbor would consent to using his field for the effluent.
3. Rebuild the roof of spring house.

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FISH HEALTH

Pairings for specific pathogen free broodstock replacements totaled 131 pairs or 262 individuals. Non-lethal ovarian fluid samples from females and lethal spleen, kidney, and pyloric caeca samples from males were tested. Of note, all adults tested were negative for IPN virus (Table 2). Since 1987, 810 adult rainbow trout have tested negative for IPN. This is encouraging!

However, two females from the last egg-take for broodstock replacements yielded positive results for BKD by the FAT technique (Table 2). Eggs from these families were excluded from the broodstock replacement population. Other pairings tested low and moderate by ELISA technique. These fish were males. Progeny from these families were included in the broodstock replacement population. A summary of BKD monitoring by FAT and ELISA techniques of adults from the earthen pond suggests the incidence of detection was 17.6%. A plan to address BKD is being reviewed. The plan will tentatively include: elimination of progeny from the replacement broodstock population when females are found to be positive by FAT; injection of adults with erythromycin; and/or feed erythromycin-treated diet. If a non-lethal technique (serum) for females is developed, the criteria for elimination from future broodstock population would include: ELISA - heavy, ELISA - moderate, and possibly ELISA -low.

Production fish reared in Loving Creek water were tested for whirling disease and IPN. Results were negative for the third consecutive season. Fish are maintained in spring and well water until 3 inches long before being transferred to Loving Creek water. Coldwater disease, or Flexibacter psychrophilus, remained the most serious pathogen in catchables and fingerling. Feeding Terramycin during initial feed training and/or feeding oxolinic acid top-dressed feed did not affect a significant reduction in mortality. In a related area, the interperitoneal injection of oxytetracycline to broodstock has proven to prevent the detection of Flexibacter psychrophilus in ovarian fluid six weeks post-injection. These injections are hoped to retard possible transmission to eggs and progeny at receiving stations. Minor outbreaks of bacterial gill disease were controlled with Chloramine T.

FISH STOCKED AND TRANSFERRED

This past year, 1991, represented the second season of a fall fingerling program. Hayspur has been requested to produce between 250,000 and 300,000 fall fingerling for Magic Reservoir. The end of irrigation drawdown occurs the end of September on Magic Reservoir. Fingerling (250,060) were stocked into drought-reduced Magic Reservoir (Table 3.). Great difficulty has been experienced holding these 250,000 fingerling in addition to next season's catchables. Reducing the fall fingerling request from 250,000 to 125,000 has been approved for the 1992 season.

Redistribution of catchables has involved Mullan and Sawtooth hatcheries. Mullan redistribution was interrupted from 1989 to 1991 as a result of whirling

disease detection in 1988. With a whirling disease negative status for four year classes, 32,704 catchables were transported to Mullan Hatchery in 1991. Since 1990, catchables have been transferred to Sawtooth Hatchery. These catchables are stocked into small accessible lakes, Salmon River tributaries, and the mainstem Salmon River by Sawtooth Hatchery personnel. Local businessmen and anglers of the Stanley Basin have favorably supported the more frequent stockings. Catch rates have improved (Rick Alsager, personal communication). A total of 57,229 catchables were redistributed and stocked in the Stanley area during the 1991 season. Hayspur personnel stocked the large accessible lakes (Redfish, Alturas, and Stanley).

As part of an evaluation of catchable return-to-the-creel by size in Rock Creek, 1,05C catchables averaging one fish per pound were transferred to the Hagerman Hatchery. Also, 4,966 specific pathogen-free broodstock replacements were transported to Nampa Hatchery for rearing (Table 3). These fish represent half of the Brood Year 1990 replacement population and will be returned to Hayspur prior to the 1992 spawning season.

Catchables numbering 246,839 and weighing 83,328 pounds were produced during 1991. Catchables stocked by Hayspur personnel totaled 150,890 and averaged 2.9 per pound. The fish were stocked into the Big and Little Wood drainages, the Camas Prairie, Lava Lake, and the Stanley Basin.

FISH SPAWNING

Spawning season at Hayspur has evolved into a 5-month project with a season total of over 11 million eggs taken (Tables 4 and 5). Photoperiod manipulation or light control has expanded the "normal" spawn timing to better meet the requests of six resident hatcheries. For the period covered, Hagerman, Nampa, American Falls, Grace, Ashton, and Hayspur received eggs generated by various populations at Hayspur (Table 6). These *spawning* populations include: 1. Hayspur rainbow (R9) contained in the earthen brood pond. This population could be considered the founding population. As such, the population is of mixed year classes and numbers approximately 2,000+ individuals. A total of 769,900 eyed eggs were produced. This population is the source of adults for the one female by one male matings which are evaluated by the Eagle Fish Health Lab. Families with specific pathogen-free (SPF) status will contribute progeny to the broodstock replacement population. 2. SPF Hayspur rainbow (R9) contained in covered circular ponds. These fish are adults from one on one pairings, reared at Nampa, and returned as 2 year olds. The fish are segregated by year class. During the period covered, adults ages 4, 3, and 2 years old were spawned. The majority of egg production, or 6,199,648 eyed eggs, were generated by this population. 3. Skanes or Gloyd Springs Kamloop (K1) contained in two of the covered circular ponds. This population was 3 years old during the period covered. A total of 865,313 green eggs were taken from this population. Eyed eggs numbering 512,363 were shipped to Hagerman Hatchery. One pond was delayed through photoperiod manipulation to produce eggs in January through March 1992.

Spawning technique will be summarized below. Adults from each pond are sorted for ripeness once a week. Saline fertilization utilizing a .75% solution (28.3 grams of non-iodized salt per gallon of water) is used in conjunction with air spawning. Operating pressure of 4 psi is commonly used to put positive pressure in the abdominal cavity causing the eggs to exit via the vent. Fertilized eggs are rinsed and water-hardened in a 1:100 Argentine solution. Eggs are enumerated by the Von Bayer method and set in Heath stacks at 96 ounces per tray. Eggs are treated with formalin at 1,667 ppm three days a week. Once a week they are given an Argentine flush to control soft shell. Upon eye-up, the eggs are shocked via the siphon method. During the next two days, the eggs are picked with a Jensorter model JH and also hand-picked. The picked eggs are enumerated by displacement method. These eggs are packed in Whitco boxes, topped with ice cubes, and transported to the receiving hatchery.

As mentioned above, photoperiod manipulation, or light control, has enhanced the ability to provide eyed eggs when hatchery managers require them. Eyed eggs were generated in January and February of 1991 as a result of the first attempt at light control at Hayspur. Theoretically, a delay of spawn timing of a fish population is affected by: placing them on a long day (18-hours light:6 hours dark) prior to the summer solstice and maintain this program for the desired length of delay, then switched or "triggered" by a short day (6-hours light:18 hours dark). On July 1, 1990, one pond of rainbows was put on an 18-hour light:6-hour dark program. Then on October 15, 1990, this pond was put on a 6-hour light:18-hour dark program. This pond was a covered circular pond. Every effort was made to prevent external or natural light from entering the pond. The delay of 15 weeks resulted in eggs being taken in January and February. Normal time frame is October through December. Therefore, a 12-week delay was performed. A total of 635,896 eggs were taken from this population. Fecundity averaged 4,142 for this light control population compared to 4,437 for a same age "normal" population. Eye-up percentages were 73.6% for light control and 78.5% for like age "normal" population.

One pond of 3-year-old Kamloops (K1) and one pond of 3-year-old rainbows (R9) were manipulated during the period covered. On June 21, 1991, both ponds were placed on a long day (18-hour light:6-hour dark) program. On October 30, the rainbow pond was switched to a 6-hour light:18-hour dark (short day) program. The Kamloop pond was switched to the same short day program on November 30. The majority of eggs will be produced after the period covered.

Some performance parameters of the SPF rainbow (R9) population are listed below:

Fecundity			
	1989	1990	1991
2-year-old	2,544	2,467	2,525
3-year-old		3,190	3,104
4-year-old			3,705

<u>Eye-up percentage</u>			
	1989	1990	1991
2-year-old	82.8	86.3	83.6
3-year-old		80.8	84.8
4-year-old			66.3

FISH FEED

Fry were feed-trained using Rangen's dry starter. After one week, they were switched to No. 1 with TM. This suggestion by Keith Johnson was an attempt to control coldwater disease. Most lots were affected by this pathogen. Although a study was not performed, personnel felt the treated fish performed poorly. Coldwater disease was not controlled. Most fish continued on Rangen's dry diet for their entire rearing cycle (Table 7).

Broodstock were fed 1/4-inch pellets with 150 grams per ton canthaxathin added. Broodstock replacements were fed regular dry ration until large enough to eat the 1/4-inch broodstock diet.

PUBLIC RELATIONS

Tours were presented to area schools including: Bellevue Elementary, Hailey Elementary, Hailey Junior High, and the Hemingway School in Ketchum.

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Approximately 7,000 people visited the hatchery, stayed at the campground, and/or fished Gaver Lagoon or Loving Creek on hatchery property. A national level field trial event for retrievers was held during the summer. The Good Sam RV Club held a convention in the campground area.

The popular on-site Gaver Lagoon fishery attracted lots of folks to Hayspur, including kids and disabled folks. Opening weekend was attended by 600 anglers. An enforcement effort qualified the numbers as well as demonstrated a high compliance rate (no citations issued).

Television stations KMVT and KIVI covered the spawning season and fish feeding. Stu Murrell taped and used footage as part of his weekly Fish and Game report on TV and radio for Magic Valley.

Hayspur personnel assisted regional personnel with a salvage effort below Magic Reservoir. Personnel joined regional surveys for mountain quail. Instruction in broodstock management, genetics, and spawning techniques was presented to hatchery folks at the CSI Hatchery. Other efforts included spawning at Granite Creek and spawning and mortality removal at Henrys Lake.

SPECIAL PROJECTS

Golden Trout Trapping and Spawning Project at Baker Lake

Hayspur personnel operate a golden trout Oncorhynchus aquabonita trapping and spawning project at Baker Lake. Baker Lake (elevation 8,796 ft) is a 12 surface acre alpine lake in the upper Big Wood drainage. The lake is located 30 miles northwest of Sun Valley. Baker Lake is reached **via** a 1 1/4-mile hike from a trailhead at the end of Baker Creek Road.

The trap was installed on the outlet of Baker Lake on June 18, 1991. Trapping operations ran until July 14, 1991. A total of 20 golden trout and 85 Henrys Lake cutthroat O. clarki were trapped. Golden trout trapped included: 8 males, 10 females, and 2 of unknown sex (juveniles). Four females were spawned. Difficulties with obtaining ripe males when females were ripe was a problem. No eyed eggs were obtained.

On July 9, 1991, 581 golden trout fingerling (37/pound) were stocked into Baker Lake by a Forest Service contract helicopter. These introductions were of Montana stock and adipose clipped. Ashton Hatchery reared these goldens and administered a TM treatment prior to transport in an effort to control coldwater disease symptoms. Coldwater disease symptoms are observed every year during pre-spawn.

Efforts to obtain gametes of golden trout from varied sources; South Fork of the Kern river, Cottonwood lakes, or other western states, will continue in an attempt to enhance genetic diversity. A brown trout was caught by an angler

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and confirmed by Hayspur personnel. An intensive gillnetting effort is planned to remove cutthroat and brown trout biomass.

Loving Creek Rehabilitation Project

Water is diverted from Loving Creek and flows through the production raceways at Hayspur. After discharge from the hatchery, the creek flowed through a channelized portion for approximately 1,500 feet. An idea to route this channelized section to a meandering stream was promoted by Frank Gift.

On April 4, 1991, the Corps of Engineers 321st Battalion from Twin Falls started moving ground from the proposed channel. This work identified an old channel (Butte Creek) out in the cattails and willows. A private excavator (Gunderson) started a \$30,000 contract on August 15, 1991 to complete the channel. The old channel was filled in using material excavated from the new channel. Water was turned into the new channel on August 27, 1991. Bob Gardner (neighbor) volunteered dozer time and an operator to contour a pile of material left by the excavator. Bob Demorest (neighbor and angler) used a disc for seed bed preparation. Terry Gregory (Region 4 Land Manager) roller harrowed the seed bed and provided a tractor and a Brillion drill. The Flyfishers of Idaho and Boise Valley Flyfishermen worked on stabilizing the area where the old channel blended into the new channel on October 26, 1991. This work, as well as some hand work to smooth areas tore up by the excavator, was performed in the rain by the above mentioned groups of anglers. On November 4, 1991, Hayspur personnel reseeded the disturbed areas with a grass/forb mix designed by Mike Todd. A trophy regulation of 2 fish over 20 inches is in effect. High catch rates are expected. Observations indicate fish have moved into the rehabilitated creek section.

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ACKNOWLEDGEMENTS

The majority of the work involved at Hayspur was due to the efforts of folks not mentioned on the cover. These individuals are: Rick Westerhof and Brad Dredge. Rick went to the "dark" side and joined the BPA. Brad saw a chance for early retirement and promoted to Rapid River.

Roger Elmore worked as a temporary on the Baker Lake project and summer stocking season. Roger recently was hired on at the ultimate retirement station Niagara Springs. Mike Paddock, Ingo Fleming, and Bruce West completed 3-month Bio-Aide positions during the spawning season.

Table 1. Hatchery cost production summary, 1991.

<u>Fish size</u>	<u>Number of fish</u>	<u>Pounds of fish</u>
Catchables	246,839	83,328
Fingerlings	<u>250,060</u>	<u>9,992</u>
Totals	496,899	93,320
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Hatchery operation costs	\$158,800.00	
Hatchery cost per fish	0.319	
Hatchery cost per pound	\$ 1.70	
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Table 2. Fish health lab results.

Brood year	Stock	Species	Sample date	VH	VP	BK	BF	BR	BC	PW	PC
1989	Hayspur	R9	1/11/91								
1990	Hayspur	R9	2/5/91	-	-		-	-	+		
1990	Hayspur	R9	4/3/91				-	-	+		
1989	Hayspur	R9	4/15/91	-	-					-	
Brood	Baker Lake	GN	7/3/91	-	-						
Brood	Hayspur	R9	9/13/91	-	-	-	-	-	-		
Brood	Hayspur	R9	10/15/91	-	-		-	-	-		
Brood	Kamloops	K1	10/15/91	-	-		-	-	-		
Brood	Hayspur	R9	10/22/91	-	-	-				-	-
Brood	Hayspur	R9	11/6/91	-	-	-					
Brood	Hayspur	R9	11/20/91	-	-	-					
Brood	Hayspur	R9	12/4/91	-	-	-					

VH = IHN virus

VP = IPN virus

BK = BKD

BF = furunculosis

BR = enteric red mouth

BC = coldwater disease

PW = whirling disease

PC = ceratomyxosis

Table 3. Fish transfer summary, 1991.

Shipped from	Received	Average size	Number of fish
Nampa	Hayspur	20.0-21.5 inches	2,911
Hayspur	Hagerman	9.5-15.5 inches	1,050
Hayspur	Nampa	4.1-4.5 inches*	4,966
Hayspur	Mullan	9.5-11.0 inches	32,704
Hayspur	Sawtooth	9.5-14.5 inches	57,229
Hayspur	Regions 4 & 7 ^a	9.5-11.0 inches	150,890
Hayspur	Magic Reservoir ^b	4.0-4.5 inches	250,060

^aAnnual outplants of catchables in Regions 4 & 7.

^bFall fingerling releases in Magic Reservoir.

*Fingerlings for Hayspur broodstock replacement in 1992.

Table 4. Rainbow (R9) spawning summary.

Lot	Date	No. Females	No. eggs	Average fecundity	Eyed eggs	Percent eye-up
SPFL2-37	1/4/91	24	118,810	4,950	95,000	80.0
SPFL2-38	1/18/91	60	268,780	4,480	215,000	80.0
SPFL2-39	1/29/91	37	170,484	4,608	111,704	65.5
SPFL2-40	2/8/91	11	38,963	3,542	22,333	57.3
SPFL2-41	2/20/91	5	19,442	3,888	12,857	66.1
SPF3-1	10/7/91	25	77,258	3,090	63,725	82.1
SPF2-2	10/8/91	3	9,270	3,090	****	****
SPF4-3	10/8/91	19	64,688	3,405	22,075	34.1
SPF3-4	10/15/91	45	79,648	1,770	67,148	84.3
SPF4-5	10/16/91	37	140,010	3,784	102,255	73.0
REG.-1	10/17/91	3	4,060	1,353	2,900	71.4
SPF2-6	10/18/91	30	81,220	2,707	62,742	77.2
REG.-2	10/22/91	22	51,553	2,343	40,896	79.3
SPF3-7	10/23/91	25	88,897	3,556	74,052	83.3
SPF4-8	10/24/91	68	250,955	3,691	167,260	66.6
SPF2-9	10/25/91	44	129,068	2,933	101,666	78.8
SPF2-10	10/28/91	39	130,798	3,354	100,967	77.2
SPF2-11	10/28/91	52	78,865	1,517	57,537	73.0
REG.-3	10/29/91	21	52,797	2,514	39,878	75.5
SPF3-12	10/29/91	44	119,103	2,707	104,532	87.8
SPF2-13	10/30/91	9	47,651	5,295	41,167	86.4
SPF4-14	10/30/91	93	359,377	3,864	211,522	58.9
SPF2-15	10/31/91	36	92,359	2,566	50,468	54.6
SPF3-16	11/4/91	37	114,392	3,092	100,275	87.7
SPF2-17	11/5/91	47	184,285	3,921	160,468	87.1
SPF4-18	11/5/91	81	265,252	3,275	185,209	69.8
REG.-4	11/6/91	62	146,795	2,368	129,920	88.5
SPF2-19	11/6/91	111	167,053	1,505	144,886	86.7
SPF2-20	11/7/91	80	317,380	3,967	255,725	80.6
SPF2-21	11/8/91	67	217,763	3,250	188,629	86.6
REG.-5	11/12/91	33	182,435	5,528	168,401	92.3
SPF3-22	11/12/91	47	151,101	3,215	125,619	83.1
SPF2-23	11/13/91	114	397,332	3,485	363,019	91.4
SPF2-24	11/13/91	203	312,463	1,539	282,272	90.3
SPF2-25	11/14/91	87	343,883	3,953	281,681	81.9
SPF2-26	11/14/91	57	242,486	4,254	201,393	83.1
SPF4-27	11/15/91	46	191,684	4,167	148,184	77.3
SPF3-28	11/18/91	32	88,620	2,769	78,648	88.7
SPF2-29	11/19/91	63	285,666	4,534	248,609	87.0
SPF2-30	11/19/91	51	168,275	3,300	133,554	79.4
REG.-6	11/20/91	72	199,087	2,765	121,501	61.0
SPF2-31	11/21/91	80	245,347	3,067	208,984	85.2
SPF2-32	11/21/91	106	217,882	2,055	167,035	76.7

Table 4. Continued.

Lot	Date	No. Females	No. eggs	Average fecundity	Eyed eggs	Percent eye-up
SPF4-33	11/22/91	22	79,118	3,596	57,043	72.1
SPFL3-34	11/22/91	62	142,121	2,292	57,878	40.7
SPF3-35	11/25/91	19	57,921	3,048	51,470	88.9
REG.-7	11/26/91	31	95,614	3,084	82,976	86.8
SPF2-36	11/26/91	116	164,602	1,419	119,375	72.5
SPF2-37	11/27/91	102	364,663	3,575	338,906	92.9
SPF2-38	11/27/91	139	438,280	3,153	358,428	81.8
SPF4-39	11/29/91	10	42,226	4,223	29,782	70.5
SPF3-40	12/2/91	19	58,751	3,092	50,991	86.8
SPFL3-41	12/2/91	33	96,437	2,922	73,000	75.7
SPF2-42	12/3/91	41	160,147	3,906	134,534	84.0
SPF2-43	12/3/91	114	205,137	1,799	179,820	87.7
REG.-8	12/4/91	42	105,732	2,517	78,170	73.9
SPF2-44	12/5/91	50	192,656	3,853	157,285	81.6
SPF2-45	12/5/91	42	218,906	5,212	179,062	81.8
REG.-9	12/11/91	26	77,340	2,975	65,476	84.7
SPF2-46	12/12/91	46	187,687	4,080	147,147	78.4
SPF2-47	12/12/91	46	166,188	3,613	139,617	84.0
SPF2-48	12/13/91	42	211,470	5,035	180,441	85.3
REG.-10	12/18/91	19	53,122	2,796	39,782	74.9
SPFL3-49	12/18/91	30	104,238	3,475	91,379	87.7
TOTAL		3,279	10,135,593	3,091	8,074,258	79.7

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Table 5. Kamloops spawning summary.

Lot	Spawn date	No. females	Eggs taken	Average fecundity	% eve-up
K1 ^a	1/3/91	5	7,247	1,449.4	66.7
K1	9/27/91	43	164,818	3,833.0	42.1
K2	10/7/91	42	165,979	3,951.9	53.4
K3	10/15/91	33	54,359	1,647.2	69.7
K4	10/23/91	7	39,723	5,674.7	68.3
K5	10/29/91	8	11,412	1,426.5	65.0
K6	11/4/91	7	34,372	4,910.3	44.1
K7	11/18/91	13	52,185	4,014.2	68.7
K8	11/25/91	5	14,552	2,910.4	34.4
K9	12/6/91	61	129,272	2,119.2	61.3
K10	12/17/91	48	121,512	2,531.5	60.7
K11	12/30/91	31	77,129	2,488.0	87.6
Totals		298	865,313	2,864.87	59.2

Table 6. Egg shipment summary, 1991

Hatchery	Species	Total eggs shipped
American Falls	R9	481,204
Ashton	R9	306,329
Grace	R9	790,998
Hagerman	R9	3,708,315
	K1	511,908
Hayspur	R9	769,900
Nampa	R9	825,355
Washington State University	R9	15,000
	Subtotal	7,400,009
Outplant at Stanton Crossing/Big Wood River	R9	283,763
Destroyed	R9	558,584
	Subtotal	842,347
	Total	8,251,356

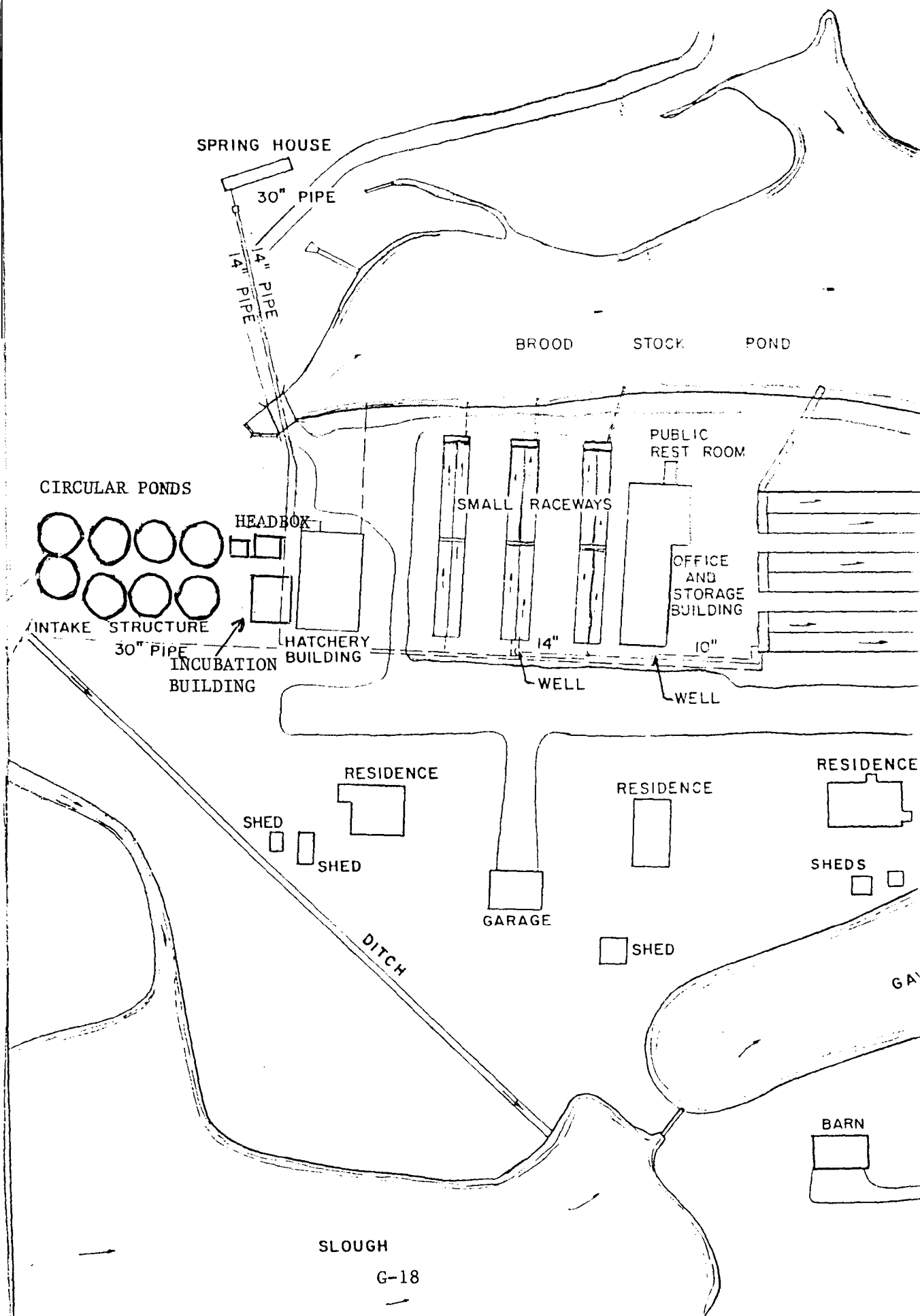
HAYTAB91

Table 7. Feed fed during the 1991 production year.

Size	Source	Pounds	Cost/ Pound	Cost
#1 Granules	Rangens	100	\$0.390	\$ 39.00
#1 Granules/TM	Rangens	150	\$0.520	\$ 78.00
#2 Granules	Rangens	2,300	\$0.390	\$ 897.00
#3 Granules	Rangens	6,100	\$0.390	\$ 2,379.00
#4 Crumble	Rangens	16,200	\$0.265	\$ 4,293.00
3/32" Pellet	Rangens	10,850	\$0.217	\$ 2,363.27
1/8" Pellet	Rangens	14,200	\$0.218	\$ 3,096.00
1/8" Pellet/TM	Rangens	7,350	\$0.469	\$ 3,450.27
5/32" Pellet	Rangens	73,910	\$0.212	\$15,706.06
1/4" Pellet	Rangens	5,000	\$0.265	\$ 1,325.00
1/4" Pellet/ red 10	Rangens	32,160	\$0.284	\$ 9,150.75
Soft-Moist 1/32"	Rangens	500	\$0.720	\$ 360.25
Totals		168,820	\$0.255	\$43,137.60

HAYTAB91

Figure 1.



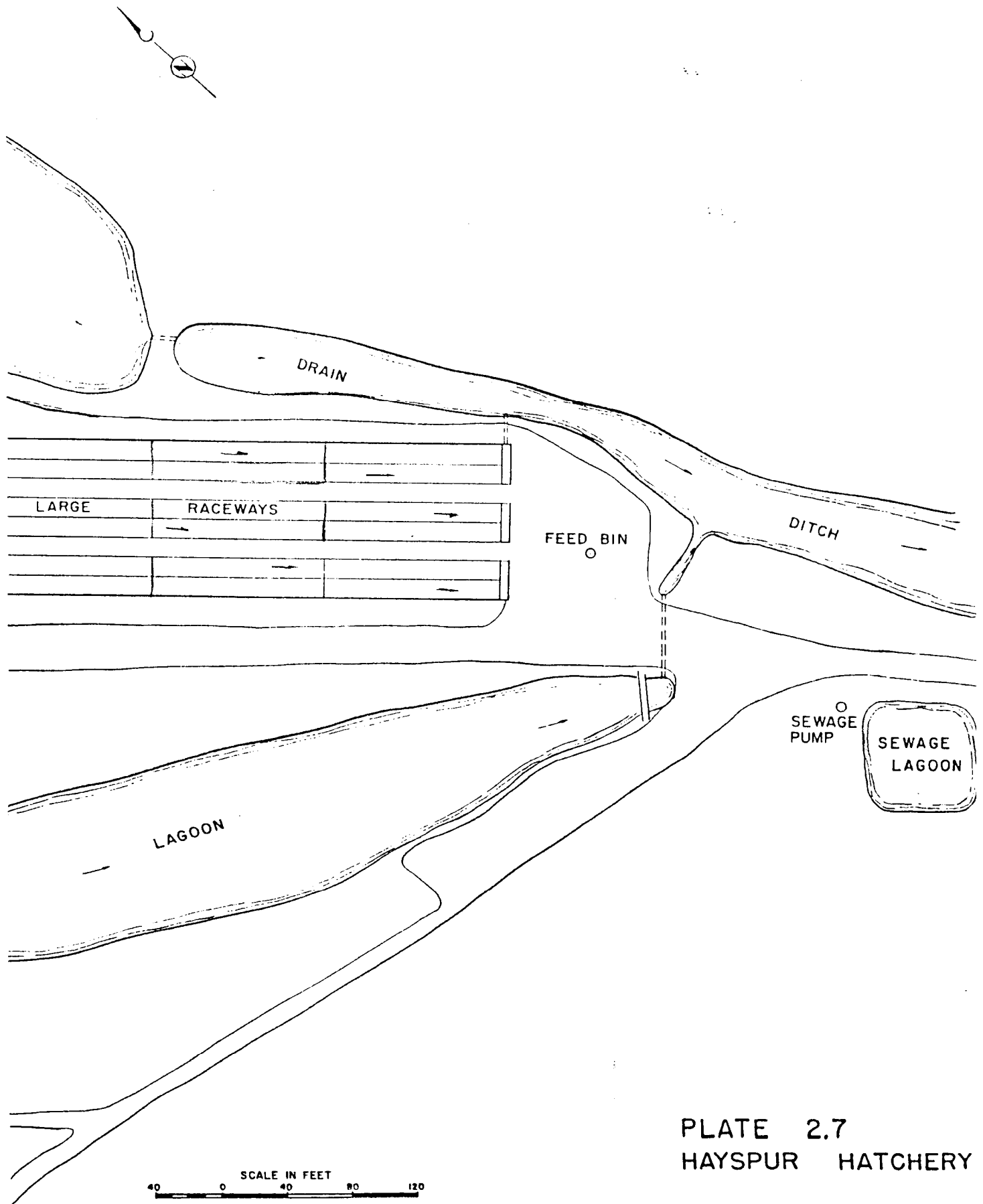


PLATE 2.7
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Figure 2.

